

AMENDMENTS TO THE CLAIMS

Claims 1-20 (cancelled)

Claim 21 (Previously Presented): A vacuum pick and place device comprising:

a plurality of pick and place nozzles, providing a lifting portion opened with an air suction port and an air suction hole where a flow rate of air sucked in from said air suction port becomes a sonic speed by a vacuum pressure, for lifting individual parts at said lifting portion by sucking in air through said air suction hole from said air suction port,

a plurality of air suction passages connected to each of said plurality of pick and place nozzles,

a pipe to which said plurality of air suction passages is connected in parallel,

a vacuum supply unit which is connected to said pipe, and, which supplies a vacuum through said pipe and said plurality of air suction passages to each of said plurality of pick and place nozzles with which a pressure at said air suction port is at least approximately twice a pressure at a downstream end of said air suction hole, and

a plurality of pick and place confirming sensors which are provided in each of said plurality of air suction passages, and, which measure a flow rate of air sucked in from said air suction port of said pick and place nozzle and output an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of the measured flow rate.

Claim 22 (Currently Amended): A vacuum pick and place device according to claim 21, wherein each of said pick and place confirming sensor of the plurality of pick and place confirming sensors includes

a base arranged in a gas channel,

a heater formed as a thin film on a surface of said base,

a plurality of temperature sensors formed as thin films on said surface of said base,

measuring means for measuring a mass flow rate on the basis of a temperature distribution in the vicinity of said heater which is measured by said temperature sensors, and

detection means for outputting an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of an output from said measurement means.

Claim 23 (Currently Amended): A vacuum pick and place device according to claim 21, further comprising:

a plurality of valves which are provided in each of said plurality of air suction passages, and, which control suction of air from each respective said pick and place nozzle using the vacuum.

Claim 24 (Currently Amended): A vacuum pick and place device according to claim 23, wherein each said pick and place confirming sensor of the plurality of pick and place confirming sensors includes

a flow sensor which measures a mass flow rate of air measured in said air suction passage between said valve and said pick and place nozzle, and

detection means for outputting an electrical signal indicating the presence or absence of a part lifted to said lifting portion on the basis of an output from said flow sensor.

Claim 25 (Currently Amended): A vacuum pick and place device according to claim 24, wherein said flow sensor detects a change in flow rate of air measured in a portion of each respective said air suction passage which is in the vicinity of each respective said pick and place nozzle.

26 - 28 (Cancelled)

Claim 29 (Currently Amended): A vacuum pick and place device according to claim 21, wherein ~~said pick and place nozzle wherein~~ an opening area of the air suction port in each respective pick and place nozzle changes in accordance with a state of a part lifted to said lifting portion.

Claim 30 (Currently Amended): A vacuum pick and place device according to claim 21, wherein said air suction hole which opens to said air suction port, ~~and~~ leads the air sucked in from said air suction port to a nozzle inner chamber of ~~said each respective~~ pick and place nozzle in communication with ~~said each respective~~ air suction passage.

Claims 31–40 (Cancelled)